

CLAIMS

What is claimed is:

1. An industrial control system, comprising:
 - 5 an aggregation component associated with an industrial controller, the aggregation component adapted to aggregate one or more selected data items into an aggregated subset of data items, the aggregation component defined and installed by an entity remote from the controller; and
 - 10 a communications component adapted to transmit the subset of data items *via* a singular communications packet across a network.
2. The system of claim 1, the entity is a client application adapted to select and request the subset of data items from the controller.
- 15 3. The system of claim 2, the client application is at least one of a data logging application and a Human and Machine Interface (HMI) that interacts with the industrial controller.
- 20 4. The system of claim 2, further comprising a communications server adapted to interact with the client application, the network and the industrial controller, the industrial controller including a communications driver to interface with the communications server and the network.
- 25 5. The system of claim 1, the communications component adapted to send a data request to the industrial controller relating to the subset of data items.

6. The system of claim 5, the industrial controller sending a response to the request including at least one of tag and value information associated with the tag, the tag and value information relating to the subset of data items.

5 7. The system of claim 6, the communications component employing the tag and value information received in the response to build the aggregation component on the industrial controller.

10 8. The system of claim 1, further comprising adding one or more other aggregation components based upon at least one of increased data demands and network protocol considerations.

9. The system of claim 8, further comprising removing the one or more other aggregation components based upon decreased data demands.

15 10. The system of claim 1, further comprising at least one of dynamically increasing and decreasing the amount of selected data items in the aggregation component based upon data demands received from the network.

20 11. The system of claim 1, the aggregation component is an object including at least one of class attributes, instance attributes, services and a data buffer.

12. The system of claim 11, the class attributes supply information such as revision level information of the object, an instance number, and a number of instances of an associated class.

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13. The system of claim 11, the instance attributes include setting for at least one of object update times, event triggers, whether to update the object based on rate, demand and other criteria, where in a data stream triggers are located, whether to continue on an overflow, number of drivers currently installed, timestamp information, size of buffers, start times, and object lifetime settings.

14. The system of claim 11, the services include at least one of Get All Attributes, Get All List, Set Attributes List, Reset, Start, Stop, Create Object and Delete Object.

15. The system of claim 11, the data buffer including at least one of 1 to L data items, L being an integer, and includes at least one of the following types: single valued elements, bit, byte, 16 bit, 32 bit, greater than 32 bit configurations, unsigned integers, signed integers, floating point elements, single dimension array, multiple dimension array configurations, and user defined tags (UDT).

16. The system of claim 15, the single valued elements include at least one of a tag identifier and an associated value.

17. The system of claim 15, the single dimension arrays include at least one of an array element ID, a value, a begin array element ID and a length.

18. The system of claim 1, further comprising removing the aggregation component based upon at least one of a loss of communications and a connection timeout.

19. The system of claim 1, further comprising removing the aggregation component based upon an explicit command.

20. The system of claim 1, further comprising at least one of receiving handle information from the industrial controller relating to the selected data items and employing the handle information to update data locations in the industrial controller.

5 21. A method to facilitate data communications with an industrial controller, comprising:

requesting tag information from a controller;

building an object from the tag information provided by the controller;

installing the object on the controller;

10 updating object data on the controller; and

receiving data from the object that has been updated by the controller.

22. The method of claim 21, further comprising interacting with the controller over a network connection.

15 23. The method of claim 21, further comprising adding data items of interest to the object, the data items arranged according to at least one of contiguous and non-contiguous address memory locations.

20 24. The method of claim 21, further comprising updating the object *via* at least one of a periodic occurrence, an event driven occurrence, and a request.

25 25. The method of claim 21, further comprising removing the object from the controller when a client no longer requests data items of interest.

26. The method of claim 25, further comprising removing the object based upon at least one of an event and network connections being disrupted for a time period that is greater than a predetermined amount of time that is configured at the controller.

27. The method of claim 21, further comprising placing data items of interest in a scanning list.

28. The method of claim 27, the list indicates which data items are to be periodically updated for a client application.

29. The method of claim 21, further comprising receiving handle information relating to one or more data items of interest from the controller.

30. The method of claim 29, further comprising employing the handle information to update memory locations on the controller.

31. A system to facilitate data communications with an industrial controller, comprising:

means for requesting tag identifiers from a controller;

means for constructing an optimized data packet from the tag identifiers requested from the controller;

means for installing the optimized data packet on the controller;

means for refreshing the optimized data packet on the controller; and

means for transmitting data from the optimized data packet that has been refreshed by the controller.

32. A signal to facilitate communications between a client application and an industrial controller, the signal comprising:

a data packet including aggregated information relating to one or more data items in an industrial controller, the one or more data items including tag and value information generated from an object installed on the controller, the aggregated information transmitted *via* a singular communications packet to mitigate transmission of superfluous network data.

33. An industrial controller, comprising:

a first component that processes information received from a remote entity;

an aggregation component that employs the information in connection with

aggregating one or more selected data items into an aggregated subset of data items; and

a communications component adapted to transmit the subset of data items *via* a singular communications packet across a network.

34. The controller of claim 33, the first component is a processor adapted to provide access to a variable memory associated with the controller, the variable memory storing the one or more selected data items.

35. The controller of claim 34, the processor interacts with the communications component to aggregate and transmit the subset of data items, the communications component is a communications driver configured for the network.

36. The controller of claim 35, the network is at least one of an Ethernet, ControlNet, a DeviceNet, RS-232, RS-422, RS-485.

37. The controller of claim 35, the communications driver adapted to communicate with a communications server associated with a client application.

38. The controller of claim 37, the client application is a Human and Machine Interface (HMI).

39. The controller of claim 37, the communications server installs the aggregation component on the industrial controller.